

## **SECTION I—CLAIMS**

### **Amendment to the Claims:**

This listing of the claims will replace all prior versions and listings of claims in the application. No claims are amended herein. Claims 1-48 are, or remain, canceled herein without prejudice. New claims 49-92 are presented herein. Claims 49-92 remain pending in the application.

### **Listing of Claims:**

- 1-48. (Canceled).
49. (New) A method in a Web service provider communicatively interfaced with a plurality of Web service clients, comprising:  
obtaining a description of a Web service comprising protocol-independent business logic;  
generating the Web service based on the description obtained, the generated Web service comprising the protocol-independent business logic in an executable format;  
generating a first virtual interface to the Web service based on the description obtained, the first virtual interface comprising a mapping of the protocol-independent business logic of the Web service to a first transport protocol, wherein the first virtual interface to provide a first Web service client access to the protocol-independent business logic of the Web service;  
processing message traffic exchanged between the first Web service client and the Web service via the first virtual interface in accordance with the first transport protocol;  
generating a second virtual interface to the Web service based on the description obtained, the

second virtual interface comprising a mapping of the protocol-independent business logic of the Web service to a second transport protocol different than the first transport protocol, wherein the second virtual interface to provide a second Web service client access to the protocol-independent business logic of the Web service without regenerating the Web service; and

processing message traffic exchanged between the second Web service client and the Web service via the second virtual interface in accordance with the second transport protocol, without regenerating the Web service.

50. (New) The method of claim 49, wherein the first transport protocol comprises: an authentication protocol compatible with a message authentication type for the message traffic exchanged between the first Web service client and the Web service.

51. (New) The method of claim 50, wherein the message authentication type comprises: an X.509 certificate authentication type based on an authentication protocol implementation of the first Web service client.

52. (New) The method of claim 49, wherein the first transport protocol is selected from the group comprising HyperText Transfer Protocol (HTTP), Simple Object Access Protocol (SOAP), SOAP over HTTP, SOAP over File Transfer Protocol (FTP), SOAP over Simple Mail Transfer Protocol (SMTP), and HTTP over Secure Socket Layer (HTTPS); and

wherein the second transport protocol is selected from the group comprising HTTP, SOAP, SOAP over HTTP, SOAP over FTP, SOAP over SMTP, and HTTPS, wherein the second transport protocol selected is different from the first transport protocol selected.

53. (New) The method of claim 49, further comprising:

processing message traffic exchanged between the first Web service client and the Web service via a third virtual interface in accordance with a third transport protocol without regenerating the Web service, wherein the third virtual interface comprises a mapping of the protocol-independent business logic of the Web service to the third transport protocol.

54. (New) The method of claim 49, wherein processing the message traffic exchanged between the first Web service client and the Web service via the first virtual interface comprises exchanging the message traffic with the Web service client through a Hyper Text Transfer Protocol (HTTP) proxy in an HTTP format.

55. (New) The method of claim 49, further comprising:  
generating a Web service client proxy responsive to a request, the Web service client proxy comprising the first virtual interface and the second virtual interface, wherein the Web service client proxy to execute at a Web service proxy server separate from the Web service provider.

56. (New) The method of claim 49, wherein the first transport protocol comprises an authentication mechanism and a transport guarantee mechanism.

57. (New) The method of claim 56, wherein the first transport protocol further comprises a specified port binding.

58. (New) The method of claim 49, wherein obtaining the description of the Web service comprises:  
obtaining a Web Service Definition Language (WSDL) document from a Universal Description, Discovery, and Integration (UDDI) directory, the UDDI directory comprising a plurality of WSDL documents, each describing one of a plurality of Web services accessible via the Web service provider, wherein the WSDL document obtained describes the Web

service comprising the protocol-independent business logic.

59. (New) A Web service provider comprising machine-readable medium having instructions stored thereon that, when executed by a processor, cause the processor to perform operations comprising:

obtaining a description of a Web service comprising protocol-independent business logic; generating a first virtual interface to the Web service based on the description obtained, the first virtual interface comprising a mapping of the protocol-independent business logic of the Web service to a first transport protocol, wherein the first virtual interface to provide a first Web service client access to the protocol-independent business logic of the Web service;

processing message traffic exchanged between the first Web service client and the Web service via the first virtual interface in accordance with the first transport protocol;

generating a second virtual interface to the Web service based on the description obtained, the second virtual interface comprising a mapping of the protocol-independent business logic of the Web service to a second transport protocol different than the first transport protocol, wherein the second virtual interface to provide a second Web service client access to the protocol-independent business logic of the Web service; and

processing message traffic exchanged between the second Web service client and the Web service via the second virtual interface in accordance with the second transport protocol.

60. (New) The Web service provider of claim 59, wherein the first transport protocol comprises: an authentication protocol compatible with a message authentication type for the message traffic exchanged between the first Web service client and the Web service.

61. (New) The Web service provider of claim 60, wherein the message authentication type

comprises:

a digital certificate authentication type based on an authentication protocol implementation of the first Web service client.

62. (New) The Web service provider of claim 59, wherein the first transport protocol is selected from the group comprising HyperText Transfer Protocol (HTTP), Simple Object Access Protocol (SOAP), SOAP over HTTP, SOAP over File Transfer Protocol (FTP), SOAP over Simple Mail Transfer Protocol (SMTP), and HTTP over Secure Socket Layer (HTTPS); and

wherein the second transport protocol is selected from the group comprising HTTP, SOAP, SOAP over HTTP, SOAP over FTP, SOAP over SMTP, and HTTPS, wherein the second transport protocol selected is different from the first transport protocol selected.

63. (New) The Web service provider of claim 59, wherein the processor to perform operations further comprising:

processing message traffic exchanged between the first Web service client and the Web service via a third virtual interface in accordance with a third transport protocol without regenerating the Web service, wherein the third virtual interface comprises a mapping of the protocol-independent business logic of the Web service to the third transport protocol.

64. (New) The Web service provider of claim 59, wherein processing the message traffic exchanged between the first Web service client and the Web service via the first virtual interface comprises exchanging message traffic with the Web service client through a Hyper Text Transfer Protocol (HTTP) proxy in an HTTP format.

65. (New) The Web service provider of claim 59, wherein the processor to perform operations further comprising:

generating a Web service client proxy responsive to a request, the Web service client proxy comprising the first virtual interface and the second virtual interface, wherein the Web service client proxy to execute at a Web service proxy server separate from the Web service provider.

66. (New) The Web service provider of claim 59, wherein the first transport protocol comprises an authentication mechanism and a transport guarantee mechanism.

67. (New) The Web service provider of claim 59, wherein the first transport protocol comprises an encryption mechanism, the encryption mechanism to encrypt the message traffic exchanged between the first Web service client and the Web service via the first virtual interface.

68. (New) The Web service provider of claim 59, wherein the first transport protocol comprises a client session protocol to define a session feature for the message traffic exchanged between the first Web service client and the Web service via the first virtual interface.

69. (New) The Web service provider of claim 59, wherein the first transport protocol comprises a port binding, the port binding defining a communication port for the message traffic exchanged between the first Web service client and the Web service via the first virtual interface.

70. (New) The Web service provider of claim 59, wherein obtaining the description of the Web service comprises:

obtaining a Web Service Definition Language (WSDL) document from a Universal Description, Discovery, and Integration (UDDI) directory, the UDDI directory comprising a plurality of WSDL documents, each describing one of a plurality of Web services accessible via the Web service provider, wherein the WSDL document obtained describes the Web

service comprising the protocol-independent business logic.

71. (New) A Web service provider communicatively interfaced with a plurality of Web service clients, comprising:

means for obtaining a description of a Web service comprising protocol-independent business logic;

means for generating the Web service based on the description obtained, the Web service comprising the protocol-independent business logic in an executable format;

means for generating a first virtual interface to the Web service based on the description obtained, the first virtual interface comprising a mapping of the protocol-independent business logic of the Web service to a first transport protocol, wherein the first virtual interface to provide a first Web service client access to the protocol-independent business logic of the Web service;

means for processing message traffic exchanged between the first Web service client and the Web service via the first virtual interface in accordance with the first transport protocol;

means for generating a second virtual interface to the Web service based on the description obtained, the second virtual interface comprising a mapping of the protocol-independent business logic of the Web service to a second transport protocol different than the first transport protocol, wherein the second virtual interface to provide a second Web service client access to the protocol-independent business logic of the Web service; and

means for processing message traffic exchanged between the second Web service client and the Web service via the second virtual interface in accordance with the second transport protocol.

72. (New) The Web service provider of claim 71, wherein the first transport protocol comprises:

an authentication protocol compatible with a message authentication type for the message traffic exchanged between the first Web service client and the Web service.

73. (New) The Web service provider of claim 72, wherein the message authentication type comprises:

a digital certificate authentication type based on an authentication protocol implementation of the first Web service client.

74. (New) The Web service provider of claim 71, wherein the first transport protocol is selected from the group comprising HyperText Transfer Protocol (HTTP), Simple Object Access Protocol (SOAP), SOAP over HTTP, SOAP over File Transfer Protocol (FTP), SOAP over Simple Mail Transfer Protocol (SMTP), and HTTP over Secure Socket Layer (HTTPS); and

wherein the second transport protocol is selected from the group comprising HTTP, SOAP, SOAP over HTTP, SOAP over FTP, SOAP over SMTP, and HTTPS, wherein the second transport protocol selected is different from the first transport protocol selected.

75. (New) The Web service provider of claim 71, further comprising:

means for processing message traffic exchanged between the first Web service client and the Web service via a third virtual interface in accordance with a third transport protocol without regenerating the Web service, wherein the third virtual interface comprises a mapping of the protocol-independent business logic of the Web service to the third transport protocol.

76. (New) The Web service provider of claim 71, wherein the means for processing the message traffic exchanged between the first Web service client and the Web service via the first virtual interface comprises exchanging message traffic with the Web service client

through a Hyper Text Transfer Protocol (HTTP) proxy in an HTTP format.

77. (New) The Web service provider of claim 71, further comprising:

means for generating a Web service client proxy responsive to a request, the Web service client proxy comprising the first virtual interface and the second virtual interface, wherein the Web service client proxy to execute at a Web service proxy server separate from the Web service provider.

78. (New) The Web service provider of claim 71, wherein the first transport protocol comprises an authentication mechanism and a transport guarantee mechanism.

79. (New) The Web service provider of claim 71, wherein the first transport protocol comprises an encryption mechanism, the encryption mechanism to encrypt the message traffic exchanged between the first Web service client and the Web service via the first virtual interface.

80. (New) The Web service provider of claim 71, wherein the first transport protocol comprises a client session protocol to define a session feature for the message traffic exchanged between the first Web service client and the Web service via the first virtual interface.

81. (New) The Web service provider of claim 71, wherein the first transport protocol comprises a port binding, the port binding defining a communication port for the message traffic exchanged between the first Web service client and the Web service via the first virtual interface.

82. (New) The Web service provider of claim 71, wherein the means for obtaining the description of the Web service comprises:

means for obtaining a Web Service Definition Language (WSDL) document from a Universal Description, Discovery, and Integration (UDDI) directory, the UDDI directory

comprising a plurality of WSDL documents, each describing one of a plurality of Web services accessible via the Web service provider, wherein the WSDL document obtained describes the Web service comprising the protocol-independent business logic.

83. (New) A system comprising:

a Universal Description, Discovery, and Integration (UDDI) directory, the UDDI directory comprising a plurality of WSDL documents, each describing one of a plurality of Web services;

a Web service provider communicatively interfaced with the UDDI director and a plurality of Web service clients, wherein the Web service provider to:  
obtain a WSDL document from the UDDI directory describing a Web service comprising protocol-independent business logic,

generate a first virtual interface to the Web service based on the WSDL document, the first virtual interface comprising a mapping of the protocol-independent business logic to a first transport protocol, and

generate a second virtual interface to the Web service based on the WSDL document, the second virtual interface comprising a mapping of the protocol-independent business logic to a second transport protocol, different than the first transport protocol;

a first Web service client communicably interfaced with the Web service provider via the first transport protocol, wherein the first Web service client to send message traffic to the Web service via the first virtual interface at the Web service provider in accordance with the first transport protocol; and

a second Web service client communicably interfaced with the Web service provider via the

second transport protocol, wherein the second Web service client to send message traffic to the Web service via the second virtual interface at the Web service provider in accordance with the second transport protocol.

84. (New) The system of claim 83, wherein the first transport protocol comprises: an authentication protocol compatible with a message authentication type for the message traffic exchanged between the first Web service client and the Web service.

85. (New) The system of claim 84, wherein the message authentication type comprises: a digital certificate authentication type based on an authentication protocol implementation of the first Web service client.

86. (New) The system of claim 83, wherein the first transport protocol is selected from the group comprising HyperText Transfer Protocol (HTTP), Simple Object Access Protocol (SOAP), SOAP over HTTP, SOAP over File Transfer Protocol (FTP), SOAP over Simple Mail Transfer Protocol (SMTP), and HTTP over Secure Socket Layer (HTTPS); and

wherein the second transport protocol is selected from the group comprising HTTP, SOAP, SOAP over HTTP, SOAP over FTP, SOAP over SMTP, and HTTPS, wherein the second transport protocol selected is different from the first transport protocol selected.

87. (New) The system of claim 83, wherein the Web service provider to process message traffic exchanged between the first Web service client and the Web service via a third virtual interface in accordance with a third transport protocol without regenerating the Web service, wherein the third virtual interface comprises a mapping of the protocol-independent business logic of the Web service to the third transport protocol.

88. (New) The system of claim 83, further comprising:

a Web service proxy server separate from the Web service provider to receive a Web service client proxy from the Web service provider, the Web service client proxy comprising the first virtual interface and the second virtual interface, wherein the Web service client proxy to execute at the Web service proxy server.

89. (New) The system of claim 83, wherein the first transport protocol comprises an authentication mechanism and a transport guarantee mechanism.

90. (New) The system of claim 83, wherein the first transport protocol comprises an encryption mechanism, the encryption mechanism to encrypt the message traffic sent to the first virtual interface.

91. (New) The system of claim 83, wherein the first transport protocol comprises a client session protocol to define a session feature for the message traffic sent to the first virtual interface.

92. (New) The system of claim 83, wherein the first transport protocol comprises a port binding, the port binding to define a communication port for the message traffic sent to the first virtual interface.